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GENERAL DYNAMICS
ASTRONAUTICS

A2136-1 (REV. 6-61)

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AD851339

REPORT NO. AE62-0493
DATE 4 May 1962
NO. OF PAGES 10

(CIIIIII)

GENERAL DYNAMICS | ASTRONAUTICS

ELECTROMAGNETIC INTERFERENCE CONTROL
TEST PLANS FOR THE
NIKE ZEUS TARGET MISSILE AIRBORNE COMPONENTS

4 May 1962

GENERAL DYNAMICS
ASTRONAUTICS

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AE62-0493

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<u>Supplement</u>	<u>Component</u>	<u>Issue Date</u>
A	Leland Rotary Inverter	5/4/62
B	Telemetry Battery	5/4/62
C	Propellant Level Control Unit	5/4/62
D	Initial Calibration - Propellant Level Control Unit	5/4/62
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- References: (A) Space Technology Laboratories 6201-0004-NU-R01
Electro-Interference Control
(B) BSZ L/C AFO4(647)-830, Electromagnetic
Interference Engineering Test, BSZF
(Maj. Cusworth/1150)
(C) GD/A letter - EW:LGC:bjv 549-8-18656 dated
3 January 1962 Proposal for Nike Zeus
Target Support Program, Airborne Equipment
Compliance with STL Specification
6201-0004-NU-R01
(D) Aerospace Corporation 62-1934.2.2.11
Summary of Electro-Interference Meeting on
9 January 1962.

1.0 OBJECT

This report will be the basic test plan for all airborne components listed in paragraph 2. and tested in accordance with CCN 31 to AFO4(647)-830.

1.1 Detailed Test Plans

Individual component test plans will be issued as supplements to the report as the test specimens become available. The Supplements shall contain information required by paragraph 4.1.2 a, d, e, f, and g of reference (A). This basic test plan includes information applicable to all tests.

2.0 BACKGROUND

CCN 31 to AFO4(647)-830 authorized electromagnetic interference tests in accordance with reference (A) over and above the requirements of the Specification MIL-I-26600 USAF. These tests will provide interference level information in the electromagnetic spectrum not covered by MIL-I-26600 and MIL-I-6181B. The airborne components scheduled for test and the tests to be performed on each component are as follows:

<u>Item</u>	<u>Component</u>	<u>Part No.</u>	<u>Test Code</u>
A	Telemetry Battery	27-07498-1	1,2
B	Telemetry Assembly	27-12762-1	1,2,3,4
C	Servo Amplifier Filter	27-44535-1	1,2,3,4
D	Programmer	27-44536-1	1,2,3,4
E	Rate and Displacement Gyro	27-44534-1	1,2,3,4
F	Rate Gyro Assembly	27-45043-803	1,2,3,4
G	Inverter	7-06349-801	1,2

2.0 BACKGROUND (Contd.)

<u>Item</u>	<u>Component</u>	<u>Part No.</u>	<u>Test Code</u>
H	Arming Device Electrical Destructer	27-36244-1	1,2
I	Destructer Unit	27-04306-3	1,2
J	Power and Signal Control Unit	27-36236-803	1,2,3,4
K	Valve Shutoff Mtr.Operated	27-08116-11	1,2
L	Valve Relief and Shutoff	27-80750-15	1,2
M	Valve Fuel, Fill & Drain	7-02315-5	1,2
N	Oxidizer, Fill and Drain	27-02102-829	1,2
O	Arm and Enable Unit - Tank Fragmentation	27-36319-1	1,2,3,4
P	Propellant Level Control Assembly Unit	27-44432	1,2,3,4

Test CodeFrequency Spectrum

1	Conducted Interference	30 cps to 150 kilocycles
2	Radiated Interference	15 kilocycles to 150 kilocycles
3	R.F. Susceptibility	15 kilocycles to 150 kilocycles
4	Transient Susceptibility	

3.0 INTERFERENCE TESTS3.1 Conducted Interference

30 cps to 150 kc. As specified in paragraph 3.5.1.1.2 of reference (A), the Stoddart 91350-1 current probe shall be used for conducted interference measurements in this frequency range.

3.1.1 Measurements from 30 cps to 15 kcs. In accordance with paragraph 3.5.1.1.2.1 of Reference (A), the Stoddart NM40A receiver shall be used for measurements in the frequency range. When making conducted interference measurements on AC lines, a band elimination filter may be inserted in series with the current probe to eliminate the power line frequency if power frequency current is sufficiently high to drive the receiver above specification limits.

3.1.2 Measurements from 15 kcs to 150 kcs. In accordance with paragraph 3.5.1.1.2.2 of reference (A), the Empire NF-105 receiver with the TX/NF-105 tuning unit or the Stoddart NM10A receiver shall be used in this frequency range. The receiver shall be terminated in 50 ohms impedance.

3.0 INTERFERENCE TESTS (Contd.)

3.2 Radiated Interference

15 kcs to 150 kcs. The Empire NF-105 receiver with the TX/NF-105 tuning unit or the Stoddart NM10A receiver shall be used in this frequency range. Tests shall be conducted in accordance with paragraph 3.5.1.2 of reference (A).

3.3 RF Conducted Susceptibility

15 kcs to 150 kcs. RF Conducted Susceptibility tests shall be performed in this frequency range in accordance with paragraph 3.5.2 and 3.5.2.1 of reference (A) with the following exception: the sine wave voltages specified by reference (A) shall be measured as an open circuit voltage across the secondary of the isolation transformer, i.e., the power source is disconnected. This exception was proposed in reference (C) and concurred with by reference (D).

3.4 Transient Susceptibility

The transient susceptibility test shall be conducted in accordance with paragraph 3.5.2.3 of reference (A).

4.0 INTERFERENCE MEASURING INSTRUMENTS

4.1 Detector Functions and Methods of Calibration

4.1.1 Frequency range 30 cps to 15 kcs. For all measurements the NM40A shall be precalibrated with its internal calibration oscillator. Broadband measurements shall be taken with the instrument set in the "Wideband Peak" mode of operation. CW measurements shall be taken with the instrument in the "Selective" mode 60 cycle bandwidth.

4.1.2 Frequency Range 15 kcs to 150 kcs.

4.1.2.1 Measurements with the NF-105. The internal impulse generator shall be used to calibrate the NF-105. For broadband measurements the slideback procedure or the precalibrated meter procedure shall be used and the detector function shall be in the "Peak" position. For CW measurements, the detector function shall be in the "Carrier" position.

4.1.2.2 Measurements with the NM10A. The internal calibrator shall be used to calibrate the NM10A. For broadband measurements the slideback procedure or the precalibrated meter procedure shall be used and the detector function shall be in the "Peak" position. For CW measurements the detector function shall be in the "Field Intensity" position.

4.2 Selection of Frequencies

The interference measuring instrument shall be slowly tuned through each frequency octave and the frequencies at which maximum interferences or susceptibility is obtained shall be selected as test frequencies. Test frequencies shall not be selected prior to the interference test, except when making broadband transient interference measurements. A minimum of three measurements shall be made in each frequency octave.

5.0 GROUPS OF COMPONENTS TESTED JOINTLY

The Arm Enable Unit - Tank Fragmentation P/N 27-36319-1 and the Destructor Unit P/N 27-04306 shall be tested together. The Destructor Unit is actuated by the Arm Enable Unit - Tank Fragmentation and the former provides a load for the latter. Also, the latter provides diode transient suppression for the former. It is desirable to test these jointly. Concurrence in the joint test will be obtained from Aerospace prior to test as requested by reference (D).

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SUPPLEMENT A

(GIIIIII)

GENERAL DYNAMICS | ASTRONAUTICS

ELECTROMAGNETIC INTERFERENCE CONTROL

TEST PLAN FOR THE

LELAND ROTARY INVERTER

P/N 7-06349-801

4 May 1962

PREPARED BY *E. Beaver*
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SUPPLEMENT A

AE62-0493

Subject: Electromagnetic Interference Control Test Plan for
the Leland Rotary Inverter P/N 7-06349-801

1.0 OBJECT

The following electromagnetic interference tests shall be conducted to determine the conducted and radiated interference of the Leland Rotary Inverter below 150 KCS.

2.0 TEST PROCEDURE

2.1 Conducted Interference

Conducted interference shall be measured in accordance with paragraph 3.1 of the basic test plan on the following lines:

Plus 28 VDC	Plug J-791	Pin A
115 VAC 400 cps ϕ A	Plug J-790	Pin A
115 VAC 400 cps ϕ B	Plug J-790	Pin B
115 VAC 400 cps ϕ C	Plug J-790	Pin C

2.2 Radiated Interference

Radiated interference shall be measured in accordance with paragraph 3.2 of the basic test plan.

3.0 TEST EQUIPMENT

3.1 Nomenclature of the Interference Measuring Equipment

<u>Manufacturer</u>	<u>Type</u>	<u>Model</u>	<u>S/N</u>
Empire Devices	Field Intensity Meter	BA/NF100	323
Empire Devices	Plug-in Unit	TX/NF105	1525
Stoddart Company	Field Intensity Meter	NM 40A	211-
Stoddart Company	Current Probe	91550-1	3
Stoddart Company	Attenuator	90500-10	None
Stoddart Company	Attenuator	90500-10	None
Kin-Tel	Notch Filter	400 cps	626119
Triplett	Multimeter	630A	46873
Stavolt	DC Power Supply	A31-100KA	461

3.2 Description and Size of Shielded Enclosure

The screen room in which the test will be conducted was manufactured by Multi-Cell, Shielding Incorporated, Riverside, New Jersey. Length, width, and height - 22' x 10' x 8'. All input power lines to the screen room are filtered.

SUPPLEMENT A

AE62-0497

4.0 METHOD OF LOADING

Each of three phases of the inverter shall be loaded with three 300 Watt light bulbs.

5.0 OPERATION OF THE TEST SPECIMEN

The test specimen shall be operated at full load during the tests.

6.0 ANTICIPATED INTERFERENCE

Broadband conducted interference is expected from 5 CPS to 150 KCS on all lines. Radiated broadband interference is expected from 15 KCS to 150 KCS.

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SUPPLEMENT B

(CIIIIII)
GENERAL DYNAMICS | ASTRONAUTICS

ELECTROMAGNETIC INTERFERENCE CONTROL
TEST PLAN FOR THE
TELEMETRY BATTERY
P/N 27-07498-1

4 May 1962

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SUPPLEMENT B

AE62-0493

Subject: Electromagnetic Interference Control Test Plan for
the Eagle Pitcher Telemetry Battery P/N 27- 07498-1

1.0 OBJECT

The following electromagnetic interference tests shall be conducted to determine the conducted and radiated interference of the Eagle Pitcher Telemetry Battery heater circuit below 150 KCS.

2.0 TEST PROCEDURE

2.1 Conducted Interference

Conducted interference shall be measured in accordance with paragraph 3.1 of the basic test plan on the following lines:

115 VAC 400 cps Single phase Pin C

2.2 Radiated Interference

Radiated interference shall be measured in accordance with paragraph 3.2 of the basic test plan.

3.0 TEST EQUIPMENT

3.1 Nomenclature of the Interference Measuring Equipment

<u>Manufacturer</u>	<u>Type</u>	<u>Model</u>	<u>S/N</u>
Empire Devices	Field Intensity Meter	BA/NF105	523
Empire Devices	Plug-in Unit	PX/NF105	1525
Stoddart Company	Field Intensity Meter	NM 40A	211-4
Stoddart Company	Current Probe	91550-1	273-7
Stoddart Company	Milliammeter Recorder	90097-2	189-19
Weston Corporation	Ammeter	AC-443	116091
Bird Electric Corporation	Coaxial Switch	718	

3.2 Description and Size of Shielded Enclosure

The screen room in which the test will be conducted was manufactured by Multi-Cell, Shielding Incorporated, Riverside, New Jersey. Length, width, and height - 22' x 10' x 8'. All input power lines to the screen room are filtered.

SUPPLEMENT B

AE62-0493

4.0 METHOD OF LOADING

No load shall be placed on the battery output lines because the battery is unloaded during the operation period of the battery heater, except for short period from power changeover until launch.

5.0 OPERATION OF THE TEST SPECIMEN

During the test 115 VAC 60 cps shall be applied to the test specimen on Pins C. (Pin E is ground). A fan will be used to cool the test specimen to actuate the heater thermostat. Interference shall be measured during the actuation of the heater thermostat.

6.0 ANTICIPATED INTERFERENCE

Broadband conducted interference is expected from 50 CFS to 150 KCS on all lines. Radiated broadband interference is expected from 15 KCS to 150 KCS.

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SUPPLEMENT C

(CIIIIII)

GENERAL DYNAMICS | ASTRONAUTICS

ELECTROMAGNETIC INTERFERENCE CONTROL

TEST PLAN FOR THE

PROPELLANT LEVEL CONTROL UNIT

P/N 27-44432

4 May 1962

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SUPPLEMENT C

AF62-0493

Subject: Electromagnetic Interference Control Test Plan for
the Propellant Level Control Unit 1/N 27-44432

1.0 OBJECT

The following electromagnetic interference tests shall be conducted to determine the conducted and radiated interference below 150 KCS, RF susceptibility from 15 KCS to 150 KCS, and transient susceptibility of the Propellant Level Control Unit.

2.0 TEST PROCEDURE

2.1 Conducted Interference

Conducted interference shall be measured in accordance with paragraph 3.1 of the basic test plans on the following lines:

+28 VDC	Fuel - Input power	Plug 203U6J1	Pin A
+28 VDC	Lox - Input power	Plug 203U6J1	Pin B
Valve Command		Plug 203U6J2	Pin F
Valve Command		Plug 203U6J2	Pin A
Lox 95% A Signal		Plug 203U6J3	Pin X
Fuel 97% Signal		Plug 203U6J4	Pin A

2.2 Radiated Interference

Radiated interference shall be measured in accordance with paragraph 3.2 of the basic test plan.

2.3 RF Conducted Susceptibility

RF conducted susceptibility shall be performed in accordance with paragraph 3.3 of the basic test plan on the following lines:

+28 VDC	Fuel - input power	Plug 203U6J1	Pin A
+28 VDC	Lox - input power	Plug 203U6J1	Pin B

Criteria for malfunction shall be any change in the position of the fuel or lox relays in the unit.

2.4 Transient Susceptibility

The transient susceptibility test shall be performed in accordance with paragraph 3.4 of the basic test plan on the following power lines:

+28 VDC	Fuel - input power	Plug 203U6J1	Pin A
+28 VDC	Lox - input power	Plug 203U6J1	Pin B

Criteria for malfunction shall be any change in the position of the fuel or lox relays in the unit.

SUPPLEMENT C

AE62-0493

3.0 TEST EQUIPMENT

3.1 Nomenclature of the Interference Measuring Equipment

<u>Manufacturer</u>	<u>Type</u>	<u>Model</u>	<u>S/N</u>
Kearse Devices	Field Intensity Meter	KE-105	929
Stoddart	Current Probe	91550-1	
Stoddart	Field Intensity Meter	NM-40A	211-9
Stoddart	Power Supply	91182-2	211-9
Hewlett Packard	Vacuum Tube Voltmeter	400D	HP 112-6
Hewlett Packard	Oscillator	400AB	
McIntosh	Amplifier	MC60	3F296
General Dynamics Astronautics	Transient Generator		

3.2 Description and Size of Shielded Enclosure

The screen room in which the test will be conducted was manufactured by Multi-Cell, Shielding Incorporated, Riverside, New Jersey. Length, width, and height - 22' x 10' x 8'. All input power lines to the screen room are filtered.

4.0 METHOD OF LOADING

Variable resistors will be placed on Pins A, E, J and N of plug J3 to simulate the sensors in the liquid oxygen tank. Activation of the relays is accomplished by adjusting the potentiometer such that the voltage presented to the relay through the transistor amplifier is sufficient to cause current to flow through the relay coil. Crystal oscillators will be placed on Pins A, E and G of plug J4 to activate the fuel sensor relays. All valve command signals shall be fed to MS25269-D1 relays which are suppressed by type JN538 diodes in parallel with the relays.

5.0 OPERATION OF THE TEST SPECIMEN

During the test 28 VDC shall be applied to two 28 VDC inputs. (Fuel input Pin A, and Lox input Pin B.) Interference shall be measured when the Fuel or Lox relays are actuated by adjustment of the potentiometers specified in paragraph 4.0 above.

6.0 ANTICIPATED INTERFERENCE

Broadband conducted interference is expected from 30 CPS to 150 KCS on all lines. Radiated broadband interference is expected from 15 KCS to 150 KCS.

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SUPPLEMENT D

(CIIIIII)

GENERAL DYNAMICS | ASTRONAUTICS

ELECTROMAGNETIC INTERFERENCE CONTROL

TEST PLAN FOR THE ARM ENABLE -

TANK FRAGMENTATION UNIT

MODEL 27-36319-1

14 June 1962

GENERAL DYNAMICS
ASTRONAUTICS

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SUPPLEMENT D

AE62-0493

Subject: Electromagnetic Interference Control Test Plan
for the Arm Enable - Tank Fragmentation Unit
P/N 27-36319-1

1.0 OBJECT

The following electromagnetic interference tests shall be made to determine the conducted and radiated interference below 150 KCS, and to test for transient and RF conducted susceptibility.

2.0 TEST PROCEDURE

2.1 Conducted Interference

Conducted broadband interference shall be measured in accordance with paragraphs 3.1, 3.1.1, and 3.1.2 of the basic test plan.

The following lines will be monitored with a current probe (+) 28 VDC and pins (D, L, J, K, P) of Plug Pl. The measurements will cover a frequency range from 30 cycles/second to 150 kilocycles/second.

2.2 Radiated Interference

Radiated broadband interference shall be measured in accordance with paragraph 3.2 of the basic test plan.

2.3 RF Conducted Susceptibility

RF conducted susceptibility shall be performed in accordance with paragraph 3.3 of the basic test plan on all input +28 VDC lines.

2.4 Transient Susceptibility

Transient susceptibility shall be conducted in accordance with paragraph 3.4 of the basic test plan on all input +28 VDC lines.

Criterion for failure of the Arm Enable - Tank Fragmentation Unit shall be any change in position of the relays within the unit.

3.0 TEST EQUIPMENT

SUPPLEMENT D

AE62-0493

3.1 Nomenclature of the Interference Measuring Equipment

<u>Manufacturer</u>	<u>Type</u>	<u>Model</u>	<u>S/N</u>
Empire Devices	F.I.M.	BA/NF105	1273
Empire Devices	Tuning Head	TX/NF105	1525
Stoddart Company	F.I.M.	NM10A	
Stoddart Company	Recorder	Milliammeter	103608
Stoddart Company	F.I.M.	NM40A	211-4
Stoddart Company	Current Probe	91550-1	
Bird Corporation	Co-ax. Switch	718	
Tektronix	Oscilloscope	545	9498
Triplett	V.O.M.	630A	46873

3.2 Description and Size of Shielded Enclosure

The screen room in which the test will be conducted was manufactured by Multi-Cell Shielding Incorporated, Riverside, New Jersey. Length, width, and height - 22' x 10' x 8'. All input power lines to the screen room are filtered.

4.0 METHOD OF LOADING

The Arm and Enable Tank Fragmentation Unit shall be loaded as follows:

Plug J1

Pin A, B, C, J, K, M, S	28VDC (Supply A)
Pin D, L, P	28VDC (Supply A through toggle switches)
Pin N, R	28VDC (Supply B through button switches)
Pin F	Ground
Pin Z, W, a, b, d, e	40 ma indicator lamps
Pin X, Y	75K ohm
Pin g	Destructor Unit Ledex Coil

5.0 OPERATION OF THE TEST SPECIMEN

The three relays of the unit shall be operated individually and interference measurements shall be taken during relay activation.

6.0 ANTICIPATED INTERFERENCE

Broadband conducted interference is expected from 30 cps to 150 KCS on all lines. Radiated broadband interference is expected from 15 KCS to 150 KCS. No CW interference is anticipated.

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SUPPLEMENT E

(CIIIIII)
GENERAL DYNAMICS | ASTRONAUTICS

ELECTROMAGNETIC INTERFERENCE CONTROL

TEST PLAN FOR THE

DESTRUCTOR UNIT

P/N 27-04306-3

14 June 1962

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SUPPLEMENT E

AE 62-0493

**Subject: Electromagnetic Interference Control Test Plan
for the Destructor Package P/N 27-04306-3.**

1.0 OBJECT

The following electromagnetic interference tests shall be made to determine the conducted and radiated interference below 150 KCS.

2.0 TEST PROCEDURE

2.1 Conducted Interference

Conducted Interference shall be measured in accordance with paragraphs 3.1, 3.1.1 and 3.1.2 of the basic test plan.

The following lines will be monitored with a current probe:

pin A	+28V DC to Lodox Coil
pin D	+28V DC
pin F	Squib Input
pin H	Squib Input
pin J	Squib Ground

The measurements will cover a frequency range from 30 cycles/second to 150 kilocycles / second.

2.2 Radiated Interference

Radiated broadband interference shall be measured in accordance with paragraph 3.2 of the basic test plan.

3.0 TEST EQUIPMENT

3.1 Nomenclature of the Interference Measuring Equipment

<u>Manufacturer</u>	<u>Type</u>	<u>Model</u>	<u>S/N</u>
Empire Devices	Field Intensity Meter	BA/NF105	1273
Empire Devices	Plug-in Unit	TX/NF105	1525
Stoddart Company	Field Intensity Meter	NM40A	211-4
Stoddart Company	Current Probe	91550-1	
Bird Corporation	Co-Axial Switch	718	
Tektronix	Oscilloscope	545	9498
Triplet	V. O. M.	630A	46873

SUPPLEMENT E

AE 62-0493

3.2 Description and Size of Shielded Enclosure

The screen room in which the test will be conducted is manufactured by Multi-Cell Shielding Incorporated, Riverside, New Jersey. Length, width and height - 22' x 10' x 8'. All input power lines to the screen room are filtered.

4.0 METHOD OF LOADING

4.1 Method 1 - Conducted and Radiated Interference

The Destructor Unit shall be loaded with 40 ma indicator lamps on Pin C and Pin D (Arm and Safe relay contacts). The squib circuit shall be shorted as in the actual system installation. Pins F, H and J shall be shorted one foot from the Destruct Unit to simulate the actual installation.

See Figure 1.

4.2 Method 2 - Radiated Interference

The Destructor Unit shall be loaded with the Arm and Enable Unit as in the actual system installation.

See figure 2.

5.0 OPERATION OF THE TEST SPECIMEN

The Destructor Unit Ledex coil shall be activated by means of a button switch. The circuit will pass through the Arm Enable Tank Fragmentation Unit in order to utilize the diode suppression afforded by that unit.

6.0 ANTICIPATED INTERFERENCE

Broadband conducted interference is expected from 30 cps to 150 KCS on all lines. Broadband radiated interference is expected from 15 KCS to 150 KCS.

No CW interference is anticipated.

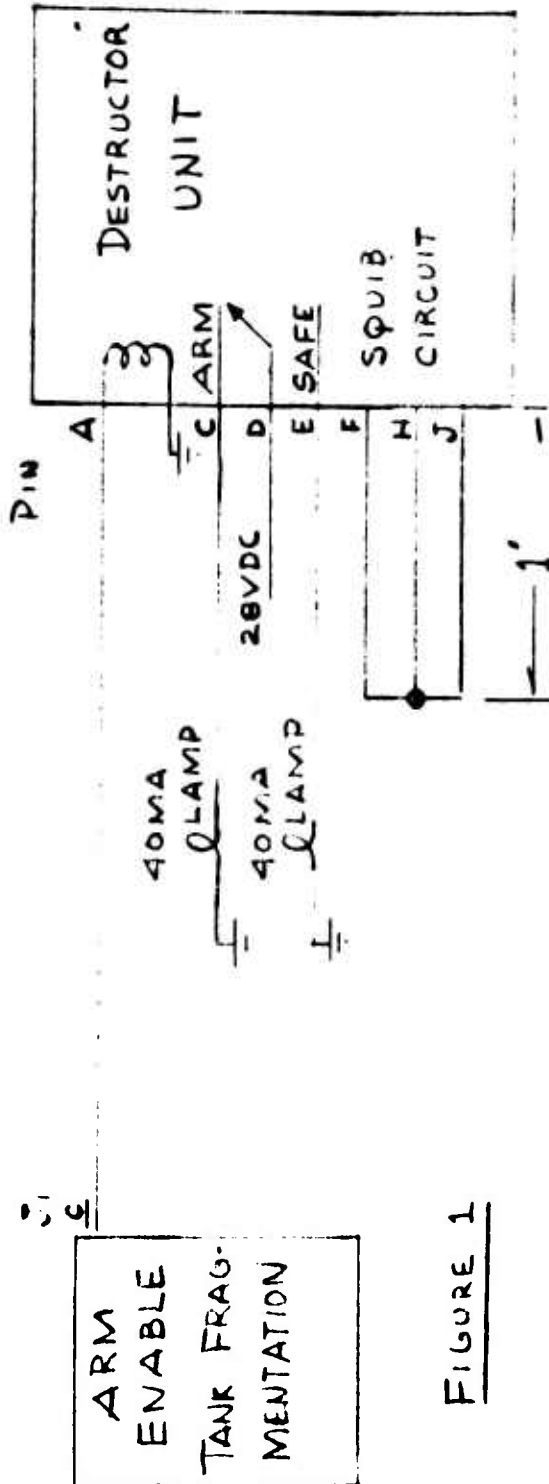


FIGURE 1

TEST SET UP FOR CONDUCTED AND RADIATED INTERFERENCE

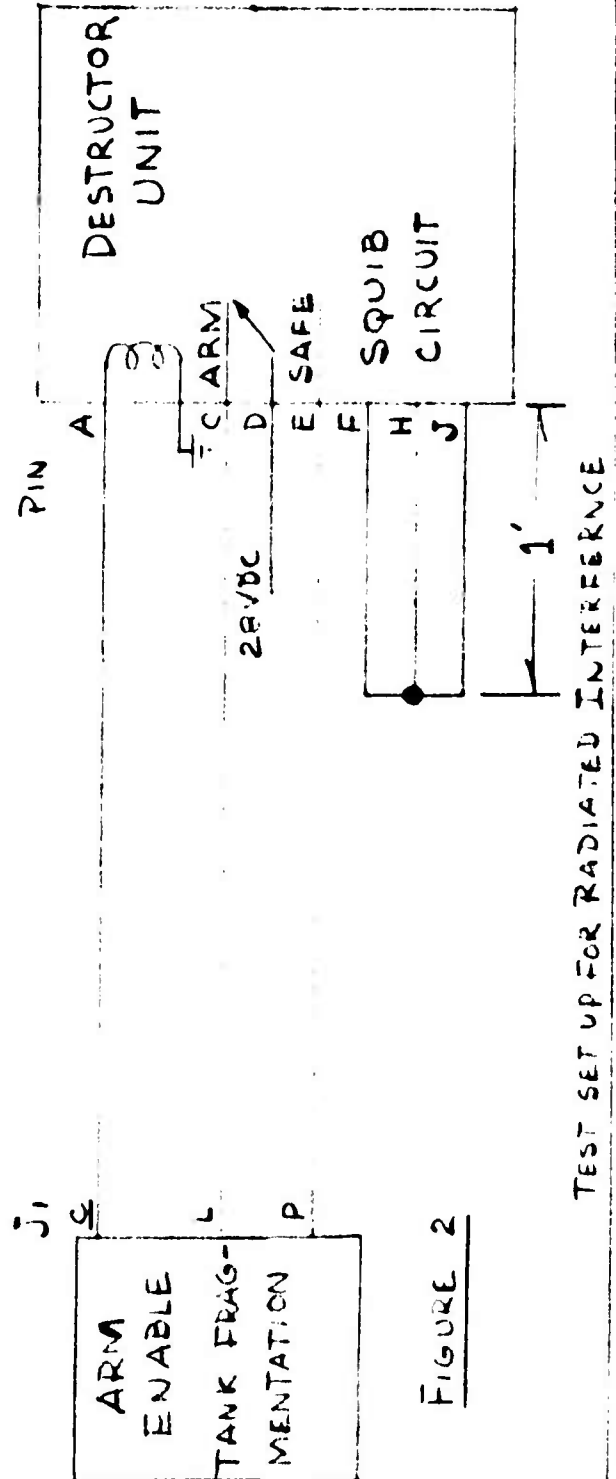


FIGURE 2

TEST SET UP FOR RADIATED INTERFERENCE

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DATE 14 June 1962
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(CIIIIII)
GENERAL DYNAMICS | ASTRONAUTICS

ELECTROMAGNETIC INTERFERENCE CONTROL
TEST PLAN FOR THE
OXIDIZER, FILL AND DRAIN VALVE
P/N 27-02102-23

14 June 1962

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SUPPLEMENT F

AE 62-0493

Subject: Electromagnetic Interference Control Test Plan
for the Oxidizer, Fill and Drain Valve
P/N 27-02102-23

1.0 OBJECT

The following electromagnetic interference tests shall be conducted to determine the conducted and radiated interference of the Oxidizer, Fill and Drain Valve below 150 KCS.

2.0 TEST PROCEDURE

2.1 Conducted Interference

Conducted interference shall be measured in accordance with paragraph 3.1 of the basic test plan on the following lines:

Plug J1	pin A	Indicator lamp supply voltage +28V DC
Plug J1	pin B	Indicator lamp
Plug J1	pin C	Clockwise Field Control +28V DC
Plug J1	pin E	Counter Clockwise Field Control +28V DC
Plug J1	pin F	Indicator lamp

2.2 Radiated Interference

Radiated interference shall be measured in accordance with paragraph 3.2 of the basic test plan.

3.0 TEST EQUIPMENT

3.1 Nomenclature of the Interference Measuring Equipment

<u>Manufacturer</u>	<u>Type</u>	<u>Model</u>	<u>S/N</u>
Empire Devices	Field Intensity Meter	BA/NF105	1273
Empire Devices	Plug-in Unit	TX/NF105	1525
Stoddart Company	Field Intensity Meter	NM40A	211-9
Stoddart Company	Current Probe	91550-1	273-7
Weston Corporation	D. C. Ammeter	301	180274-1
Triplett	V. O. M.	630A	46873

3.2 Description and Size of Shielded Enclosure

The screen room in which the test will be conducted was manufactured by Multi-Cell Shielding Incorporated, Riverside, New Jersey. Length, width and height - 22' x 10' x 8'. All input power lines to the screen room are filtered.

SUPPLEMENT F

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4.0 METHOD OF LOADING

Pins B and F of plug J-1 shall be loaded with 40 ma indicator lamps.

5.0 OPERATION OF THE TEST SPECIMEN

During the test 28V DC shall be applied to pin A and pin C or pin E. (Pin D shall be grounded). Interference shall be measured while the specimen is being actuated to the "opened" and "closed" positions.

6.0 ANTICIPATED INTERFERENCE

Broadband conducted interference is expected from 30 cps to 150 KCS. Broadband radiated interference is expected from 15 KCS to 150 KCS.

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SUPPLEMENT G

(GIIIIII)
GENERAL DYNAMICS | ASTRONAUTICS

ELECTROMAGNETIC INTERFERENCE CONTROL
TEST PLAN FOR THE
AUTOPILOT PROGRAMMER
MODEL 27-44536-3

5 July 1962

GENERAL DYNAMICS
ASTRONAUTICS
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SUPPLEMENT G

AE62-0493

Subject: Electromagnetic Interference Control Test Plan for
the Autopilot Programmer P/N 27-44536-3.

1.0 OBJECT

The following electromagnetic interference tests shall be made to determine the conducted and radiated interference below 150 KC and to test for transient and RF susceptibility.

2.0 TEST PROCEDURE

2.1 Conducted Interference

Conducted broadband interference shall be measured in accordance with paragraphs 3.1, 3.1.1, and 3.1.2 of the basic test plan. The following lines will be monitored:

<u>Pin</u>	<u>Plug</u>	<u>Nomenclature</u>	<u>Switch or Function</u>
A	1	+28V DC	Input Power
B	1	115V AC ØA	Input Power
D	1	115V AC ØC	Input Power
A	2	Increase p-y	SW 1
C	2	Actuate sustainer p-y	SW 2
W	2	Fire Retro-rockets	SW 18
X	2	Jettison Payload	SW 17
Z	2	Booster Cutoff	SW 12
Y	2	Booster Jettison	SW 13
a	2	Sustainer Cutoff	SW 19
b	2	Vernier Cutoff	SW 20
G	2	Null p-y Int.	SW 5
D	2	Actuate vern. p-y	SW 3

2.2 Radiated Interference

Radiated broadband interference shall be measured in accordance with paragraph 3.2 of the basic test plan.

2.3 RF Conducted Susceptibility

RF conducted susceptibility testing shall be conducted in accordance with paragraph 3.3 of the basic test plan on all input +28V DC lines.

2.4 Transient Susceptibility

Transient susceptibility testing shall be conducted in accordance with paragraph 3.4 of the basic test plan on all input +28V DC lines.

SUPPLEMENT G

AE62-0493

3.0 TEST EQUIPMENT

3.1 Nomenclature of the Interference Measuring Equipment

<u>Manufacturer</u>	<u>Type</u>	<u>Model</u>
Empire Devices	F.I.M.	BA/NF-105
Empire Devices	Tuning Head	TX/N-105
Stoddart Company	F.I.M.	NM 10A
Stoddart Company	Recorder	Milliammeter
Stoddart Company	F.I.M.	NM 40A
Stoddart Company	Current Probe	91550-1
Bird Corporation	Co-ax Switch	718
Tektronix	Oscilloscope	545
Triplett	V.O.M.	630A

3.2 Description and Size of Shielded Enclosure

The screen room in which the test will be conducted was manufactured by Multi-Cell Shielding Incorporated, Riverside, New Jersey. Length, width, and height respectively are: 22' x 10' x 8'. All input power lines to the screen room are filtered.

4.0 METHOD OF LOADING

The autopilot programmer will be loaded with a load simulator which was built to present a close approximation of the actual loads to the programmer for testing purposes.

5.0 OPERATION OF THE TEST SPECIMEN

The programmer shall be operated through its complete cycle, and the highest interference level at each frequency will be recorded.

6.0 ANTICIPATED INTERFERENCE

Broadband conducted interference is expected from 30 cps to 150 KCS on all lines. Radiated broadband interference is expected from 15 KCS to 150 KCS. No CW interference is anticipated.

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DATE 25 July 1962

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Supplement H

(CIIIIII)

GENERAL DYNAMICS | ASTRONAUTICS

ELECTROMAGNETIC INTERFERENCE CONTROL
TEST PLAN FOR THE
MISSILEBORNE MOTOR ACTUATED VALVE
P/N 27-08116-11

25 July 1962

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SUPPLEMENT H

AE62-0513

Subject: Electromagnetic Interference Control Test Plan
for the Missileborne Motor Actuated Valve
P/N 27-08116-11

1.0 OBJECT

The following electromagnetic interference tests shall be conducted to determine the conducted and radiated interference of the missileborne motor actuated valve 27-08116-11 below 150 KCS.

2.0 TEST PROCEDURE

2.1 Conducted Interference

Conducted Interference shall be measured in accordance with paragraph 3.1 of the basic test plan on the following lines during actuation of the valve:

<u>To Open</u>		<u>To Close</u>
Ground	PIN F	Ground
Ground	PIN D	+28VDC
+28VDC	PIN E	Open

2.2 Radiated Interference

Radiated Interference shall be measured in accordance with paragraph 3.2 of the basic test plan.

3.0 TEST EQUIPMENT

3.1 Nomenclature of the Interference Measuring Equipment

<u>Manufacturer</u>	<u>Type</u>	<u>Model</u>	<u>S/N</u>
Empire Devices	Field Intensity	DA/NF105	323
Emp	Meter		
Empire Devices	Plug in Unit	TX/NF105	1525
Stoddart Co.	Field Intensity	NM40A	211-4
	Meter		
Stoddart Co.	Current Probe	91550-1	273-3
Stoddart Co.	Attenuator	90550-10	None

SUPPLEMENT II

AE62-0513

- 3.2 Description and Size of Shielded Enclosure
The screen room in which the test will be conducted was manufactured by Multi-Cell, Shielding Incorporated, Riverside, New Jersey. Length, width, and height 22'x10'x8'. All input power lines to the screen room are filtered.
- 4.0 METHOD OF LOADING
Operating pressure of 3000 psig shall be applied to the valve to simulate actual operating conditions.
- 5.0 OPERATION OF THE TEST SPECIMEN
The test specimen shall be actuated by a double pole double throw toggle switch.
- 6.0 ANTICIPATED INTERFERENCE
Broadband conducted interference is expected from 30 CPS to 150KCS on all lines. Radiated broadband interference is expected from 15kCS to 150KCS.

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DATE 23 July 1962
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SUPPLEMENT I

(CIIIIII)
GENERAL DYNAMICS | ASTRONAUTICS

ELECTROMAGNETIC INTERFERENCE CONTROL
TEST PLAN FOR THE
ARMING DEVICE ELECTRICAL DESTRUCTOR
P/N 27-36244-1

23 July 1962

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SUPPLEMENT I

AE62-0493

Subject: Electromagnetic Interference Control Test Plan
for the Arming Device Electrical Destructor
P/N 27-36214-1

1.0 OBJECT

The following electromagnetic interference tests shall be conducted to determine the conducted and radiated interference of the Arming Device Electrical Destructor below 150 KCS

2.0 TEST PROCEDURE

2.1 Conducted Interference

Conducted interference shall be measured in accordance with paragraph 3.1 of the basic test plan on the following lines:

Plus 28 VDC	Plug J25	Pin J
"	"	Pin K
"	"	Pin P
"	"	Pin S

2.2 Radiated Interference

Radiated interference shall be measured in accordance with paragraph 3.2 of the basic test plan

3.0 TEST EQUIPMENT

3.1 Nomenclature of the Interference Measuring Equipment

<u>Manufacturer</u>	<u>Type</u>	<u>Model</u>	<u>S/N</u>
Empire Devices	Field Intensity Meter	BA/NF105	323
Empire Devices	Plug-in Unit	TX/NF105	1525
Stoddart Company	Field Intensity Meter	NM40A	211-4
Stoddart Company	Current Probe	91550-1	3

SUPPLEMENT I

AF62-0493

3.0 TEST EQUIPMENT

3.2 Description and Size of Shielded Enclosure

The screen room in which the test will be conducted was manufactured by Multi-Cell Shielding Incorporated, Riverside, New Jersey. Length, width, and height - 22' X 10' X 8'. All input power lines to the screen room are filtered.

4.0 METHOD OF LOADING

The destruct test lines (pins G and H), arm monitor (pin I), and safe monitor (pin T) shall be loaded with 40 ma indicator lights.

5.0 OPERATION OF THE TEST SPECIMEN

At each test frequency the unit shall be armed, disarmed, and given its two destruct commands while in the safe position.

6.0 ANTICIPATED INTERFERENCE

Broadband conducted interference is expected from 30 cps to 150 KC on all lines. Radiated broadband interference is expected from 15 KC to 150 KC.

REPORT NO AE62-0493 J
DATE 26 July 1962
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Supplement J

(CIIIIII)

GENERAL DYNAMICS | ASTRONAUTICS

ELECTROMAGNETIC INTERFERENCE CONTROL TEST
PLAN FOR TELEMETRY AND SIGNAL CONDITIONING UNIT
P/N 27-12762

26 July 1962

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SUPPLEMENT J

WE62-0493

Subject: Electromagnetic Interference Control Test Plan
for the Telemetry and Signal Conditioning Unit
27-12762

1.0 OBJECT

The following electromagnetic interference tests shall be conducted to determine the conducted and radiated interference below 150KCS, RF susceptibility from 15KCS to 150KCS, and transient susceptibility of the Telemetry Assembly.

2.0 TEST PROCEDURE

2.0 Conducted Interference

Conducted broadband interference shall be measured in accordance with paragraphs 3.1, 3.1.1, and 3.1.2 of the basic test plan on the following lines:

+28VDC	Internal DC Power	Plug J1	Pin P
+28VDC	External DC Power	Plug J1	Pin S

No conducted C.W. type interference is anticipated.

2.2 Radiated Interference

Radiated broadband interference shall be measured in accordance with paragraph 3.2 of the basic test plan.

No C.W. radiated type interference is anticipated.

2.3 R.F. Conducted Susceptibility

The R.F. conducted susceptibility tests shall be performed in accordance with paragraph 3.3 of the basic test plan on all input +28VDC lines.

2.4 Transient Susceptibility

Transient Susceptibility shall be conducted in accordance with paragraph 3.4 of the basic test plan on all input +28VDC lines.

Criteria for failure shall be any noise level greater than 4% of bandwidth appearing on the C.E.C. recorders at the telemetry laboratories ground stations.

SUPPLEMENT J

AF62-0493

3.0 TEST EQUIPMENT

3.1 Nomenclature of the interference measuring equipment.

<u>Manufacturer</u>	<u>Type</u>	<u>Model</u>	<u>S/N</u>
Empire Devices	FIM	BA/NF-105	1273
Empire Devices	Tuning Head	TX/NF105	1525
Stoddart Co.	FIM	NM40A	11-1
Stoddart Co.	Current Probe	91550-1	None
Stoddart Co.	Attenuator	90550-10	None

3.2 Description and size of shielded enclosure the screen room in which the test was conducted was manufactured by Multi-Cell Shielding Incorporated, Riverside, New Jersey. length, width, and height - 22'x10'x8'. All input power lines to the screen room are filtered.

4.0 METHOD OF LOADING

The telemetry accessory package is terminated in its own test console.

5.0 OPERATION OF THE TEST SPECIMEN

The package shall be operated by the power change over switch and the commutator on off switch in the test console.

6.0 ANTICIPATED INTERFERENCE

Broadband conducted interference is expected from 50 CPS to 150 KCS on all lines. Radiated broadband interference is expected from 15 KCS to 150 KCS.

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DATE 9-25-62

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Supplement L

(GIIIIII)

GENERAL DYNAMICS | ASTRONAUTICS

ELECTROMAGNETIC INTERFERENCE CONTROL
TEST PLAN FOR THE RATE AND DISPLACEMENT
GYRO PACKAGE
MODEL # 27-44534-3

25 September 1962

GENERAL DYNAMICS
ASTRONAUTICS

DEC 6 1962

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SUPPLEMENT L

AE62-0493

Subject: Electromagnetic Interference Control Test Plan for the Rate and Displacement Gyro Package.
P/N 27-14534-3

1.0 OBJECT

The following electromagnetic Interference Tests shall be performed to determine the conducted interference (50 cps to 150KC), Radiated Interference (15KC to 150KC), RF Susceptibility (15KC to 150KC), and Transient Susceptibility.

2.0 TEST PROCEDURE

2.1 Conducted Interference

Conducted Interference shall be measured in accordance with paragraphs 3.1, 3.1.1, and 3.1.2 of the basic test plan on the following lines using current probes.

<u>Nomenclature</u>	<u>Plug</u>	<u>Pin</u>
115VAC ØA	J4	A
115VAC ØB	J4	B
115VAC ØC	J4	C
+27.5VDC SMRD ckt.	J4	M
+27.5VDC (heater)	J4	J
+30VDC Amp. Supply	J2	c
Pitch Signal	J1	m
Yaw Signal	J1	p
+Roll Signal	J1	r

2.2 Radiated Interference

Radiated Interference shall be measured in accordance with paragraph 3.2 of the basic test plan.

2.3 R.F. Conducted Susceptibility

R.F. Conducted Susceptibility shall be conducted in accordance with 3.3 of basic test plan on all input +28VDC lines and 400 cps AC lines.

SUPPLEMENT 1

AE62-0493

- 2.4 Transient Susceptibility
Transient susceptibility shall be conducted in accordance with paragraph 3.4 of the basic test plan on all input +28VDC power lines.

3.0 TEST EQUIPMENT

3.1 Nomenclature of the Interference Measuring Equipment

<u>Equipment</u>	<u>Type</u>	<u>Model</u>
Empire Devices	Field Intensity Meter	BA/NF107
Empire Devices	Tuning Head	TX/NF105
Stoddart Co.	Field Intensity Meter	NM/40A
Stoddart Co.	Current Probe	91550-1
Bird Corp.	Coax Switch	718
Tektronix	Oscilloscope	545
McIntosh	Audio Amp	MC-60
Triplett	V.O.M.	630A
Hewlett-Packard	Audio Osc.	200CD
Hewlett-Packard	VTVM	400D
Hewlett-Packard	0-150VDC	711B
GD/A	Transient Generator	
GD/A	Gyro-Test Console	564-2GT-1

3.2 Description and Size of Shielded Enclosure

The screen room in which the test is conducted was manufactured by Shielded Ace Rooms, Phila., Pa. Length, width and height - 22'x10'x8'. All input power lines to the screen room are filtered.

4.0 METHOD OF LOADING

The Rate and Displacement Gyro package will be loaded by means of a test console, (564-2GT-1) supplied by Dept 564-2.

5.0 OPERATION OF TEST SPECIMEN

The Gyro package will be operated by means of test console, (564-2GT-1) supplied by Dept. 564-2

6.0 ANTICIPATED INTERFERENCE

Broadband conducted interference is expected from 30 cps to 150KC on all lines. Radiated broadband interference is expected from 15KC to 150KC. No C.W. interference is anticipated.